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An Essay on Dentition,

by

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South Carolina.

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In complying with that regulation of the Medical department of the University of Pennsylvania, which requires the candidate for a degree in Medicine, to submit to the examination of the Professors an essay upon some Medical subject, Dentition is selected in this humble attempt, to discharge that duty. The consideration of this process is of the highest importance, since in its progress we frequently find connected with it, some of the most insidious, and often fatal complaints, to which the period of infancy is liable. The limits to which an attempt of this kind must necessarily be confined, forbids me to enter into all the detail that might be embraced in a treatise on Dentition; consequently, the views taken of it will be principally confined to such steps, as are adapt=

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ed to prevent constitutional complaints. How=
ever impressed with the importance of the
subject, it would be presumption in thus
selecting, ~~it for~~ the present purpose, to enter=
tain the hope of being able to advance any
thing new: want of experience forbids an idea
of the kind. Sensible, therefore, of the dis=
advantage under which the essay must
be commenced, it is to be hoped that it will
be admissible, if reliance be placed upon the
experience of those who have made the pro=
cess of dentition the object of their researches.
But without further preliminary it may
be proper to proceed, by first noticing the for=
mation of the teeth in the fœtus, and their pro=
gressive developement before they protrude
through the gums, and the order which na=
ture pursues in accomplishing this process.
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the fœtus, the Alveolar processes, which are formed at an early period, are observed to be only shallow grooves having a number of depression or partitions, which form the sockets for the reception of their roots. In these depressions the rudiments of the teeth, both of the first and second sets, are formed, consisting of soft pulpy substances, enveloped in separate vascular membranes, called capsules. As these advance in growth we find the alveolar processes progressively increasing; hence it may be observed, that although they are attached to the jawbones, they may be considered as appendages to the teeth: making their appearance with them, assuming their shape, and disappearing as soon as they are removed or destroyed by decay. The first signs of ossification may be discovered on the surface of the pulp at several points, according

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to the different kind of teeth to be formed. Thus the Incisores and Canini, are observed to commence at one point: the bicuspides at two: and the molares at four or five points. As ossification gradually progresses, we find the pulp in like manner diminishing, until finally the whole is covered with bone, with the exception of the base, from whence proceeds in the same gradual manner by an elongation, the fang or root of the tooth. The body being now formed, the Enamel in a peculiar manner is secreted, and continues to increase until the whole surface is covered. The deposition of this substance, so well calculated to protect the teeth from common injuries, cannot be easily accounted for, but, with some degree of probability, it may be said to be secreted by the membranous capsule investing them. The enamel

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continues to increase in thickness, and particularly at the points from whence ossification commenced, until just before the protrusion of the teeth through the gums - at which time, the secretion ceases, and assumes the degree of hardness which is observed on the appearance of the teeth above the gums. The composition of this substance is similar to that of bone, but is harder than bone, and consequently not so easily destroyed. This degree of hardness may be owing to the absence of that cartilaginous or membranous structure so easily demonstrable in bone. While the secretion of enamel is going on, an elongation of the under surface of the body, according to a previous observation, takes place, and the formation and ossification of the root and neck of the tooth is finally completed. As the ossification of the body of the

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tooth proceeds from several points, in like manner does the elongation for the formation of the fangs commence at different points, according to the number attached to each tooth.

Having considered the formation of the teeth in the fetus, it follows next in order to mention the succession in which they protrude through the gums. However unimportant this part of the subject may appear, it certainly claims the attention of the Physician, in order to qualify him to give that satisfaction so often solicited by the anxious parent, while her tender offspring is exposed to this frequently dangerous process. In vain would he expect to meet with that reposed confidence, which must be the foundation of his future prospects, in the discharge of his professional duties, were he unable to relieve the anxious mind

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of the parent, by having a perfect knowledge of the order of this process; and in consequence of which he may be enabled to resort to the operation of cutting the gums, when called for, to more advantage, by applying his lancet to the very spot, where the irritation, the cause of so much uneasiness, may exist, and thereby relieve the tender patient.

The infant teeth, called deciduous, are twenty in number, and they differ in several respects from the adult teeth. Of these there are five on each side of each jaw, viz. two incisores, one cuspidatus, and two molares making ten in each jaw. They protrude through the gums in the following order in pairs, "appearing not precisely at the same time, but very near to each other." Between the fourth and eighth months after birth, the two central incisores usually make their ap=

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pearance, followed in the course of a month by those of the upper jaw immediately opposite to them. The two lateral incisores of the lower jaw protrude next in succession, the upper ones following in like manner as those of the central incisores. About the twelfth or fourteenth month, the first or anterior molares make their appearance, succeeded by the upper ones in a short time. Next in order we have the cuspidati making their appearance, between the sixteenth and twentieth month; and finally the posterior molares are cut. Thus, about the age of two years and a half, the child is in full possession of all the first set of teeth. These remain until between the sixth and seventh years, when, having completed their temporary purposes, they loosen and drop out, commencing with the central incisores. At this time

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in the posterior or back part of the jaw, the first permanent molares are observed to make their appearance, having had their rudiments formed during fetal life. The second now show themselves about the time, the cuspidati and second bicuspides are observed; and, last of all, after a long interval, the last molares or dentes sapientiæ protrudes. At this particular period, the whole number of teeth enclosed in both jaw bones are forty eight, consisting of the twenty deciduous, together with the twenty eight permanent teeth, the latter being in a state of progression during the temporary period allotted the former. This is the order in which the teeth usually make their appearance, but it must be recollected, there are many deviations from it: such as the teeth being delayed in showing themselves at the usual time: those in the upper jaw appearing first. &c.

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Having thus, in a cursory manner described the formation of the teeth in the fœtus, and their protrusion through the gums during the process of dentition, it will be unnecessary to make any remarks upon the adult teeth, by which they are followed, as they cannot be said to be immediately connected with the subject under consideration.

The consideration of the numerous diseases peculiar to early infancy, many of which are provoked or brought on by teething, has of late years occupied the attention of some of our most enlightened Medical authorities. The accuracy with which they have described them, has enabled the Physician to conduct his practice with a less degree of embarrassment, and with the result of their experience to arrive at a more successful termination. The process of dentition, with the

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many complaints attendant on it, does not appear to have escaped their investigation. Previous to the attention, which of late has been so successfully paid to the diseases of children, the subject of Dentition, terminating so frequently without scarcely any perceptable uneasiness to the child, was viewed as not coming under the classification of Diseases. As to the propriety or impropriety of this objection, we do not feel competent to decide: admitting that it may be excluded from such a classification, the medical attendant, however, frequently finds its connected with some of the most formidable complaints he has to contend with, during the period of Infancy — but these it may be alleged are brought into action by teething, induced by a high degree of excitability of the nervous systems. We find the

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alimentary canal in like manner most deeply involved, and thereby the derangement in both instances, inducing "not only disease, but in many instances, disease of an alarming and fatal character, strikingly severe in its progress and complicated in its symptoms". Hence it follows, that too much care cannot be paid to the first appearance of indisposition, during a period so painful and critical. We do not mean to infer by these remarks, however, that the process is never completed without pain or irritation ~~or~~ at least in a slight degree. This would be denying the fact; for in many instances the effects are so mild, that they are scarcely taken notice of by the parent, or those who may have the management of them - but, as observed before, there is disease, and that too in a most formidable and alarming degree. But, however, true this may be, we too

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often find the tender sufferer consigned to the immediate care of those, who by their igno= rant pretensions, and the utmost degree of presumption, without the most distant claim to that medical instruction, except in their own estimation, calculated to afford relief, obtrude themselves upon the over anxious parent to the exclusion of those whose assistance might be attend= ed with the happiest effects. To prove the propriety of this remark, we need but go to the nursery of those, who still place their reliance upon the skill of such pretenders; there we may behold the suffering infant, compelled to under= go a course of management the least calcula= ted in its result, to conduct the process to a happy issue, without inducing constitution al symptoms. Such is the confidence of the misguided parent, in such a course of man= agement, that one temporizing plan leads on

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to another, until disease of a dangerous character takes hold, without the least suspicion being entertained of its appearance. Within the last few years, however, much of the practice in the cases of children, has been confided to the care of well informed Physicians, the result of whose experience, as has been already remarked, has been made known at large.

Dr. Underwood, treating of the subject of dentition, observes, that although it may not be considered a disease, yet it induces very many diseases in children of different habits of body, and particularly the healthy and strong. The weak cut their teeth without much difficulty, tho' late; while the robust fall victims to the attendant complaints, unless the teeth are afforded an easy passage through the gums. With

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children of such habits it is reasonable to conclude, that fever is of frequent occurrence. The fever attending dentition appears to arise from the check given to secretion. In support of this, we have the assertion of Sir Astley Cooper, who, in speak= of irritative fever, to prove that it arises from the check given to secretion, advances what takes place in children during dentition. "They are sometimes put to bed quite well, yet, in the morning an arm, leg or both legs are paralyzed from the irritation of a tooth: the secretion from the Intestines stops, fever arises, and produces a hot and dry skin". Convulsions too are not unfrequently the results of this critical period. At this particular juncture, the system being disposed to take on an inflammatory action, the strong and robust, must, in a greater or less degree, be exposed to acute

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fever or convulsions. Besides these, however, there are other circumstances which are said by Dr. Underwood to affect the process of dentition. The particular season of the year appears to have some influence: thus in the winter the teeth are cut with more ease than in summer. The state of the habit appears also to affect the process, since the teeth are observed to protrude more readily with the lean than the fat; but, those children, who are loose in the bowels, are said to cut them more readily than either. With respect to the lean it may be observed, that they too, when this particular state of the body exists in too great a degree, are exposed ~~xx~~ ~~xxxx~~ to dangers as well as the robust, who, it was remarked, cut them with more difficulty; the one being exposed to acute fever or convulsions, while the other, from a state of de-

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to consist, also, on the manner in which the
teeth are cut. If there is any deviation from
the order which has been described, such
as appearing first in the upper jaw, or be=
ing cut at a distance from each other, and there=
by not contiguous to each other, there must
exist difficulty and pain; since, according to
Dr. Underwood, the contiguous tooth is aided
in its protrusion, by the one already cut
pressing against the gum and nervous mem=
brane; and thereby promoting absorption by its
stimulating effects. The circumstances un=
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signs of judging of the manner in which
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instance, particularly in the cutting of the double teeth, since some irregularity may take place with respect to the points, one projecting above the others, producing an irritation in the nervous membrane.

In an early part of this essay, it was observed, that many children pass through this important crisis, without much indisposition attending the process. A greater or less degree of irritation, however, must be the consequence; and, hence, certain symptoms must ensue, modified in their violence, according to the extent of such irritation. The process is observed to be attended with considerable irritation of the mouth, producing great heat. The child drivels profusely, in consequence of an increased quantity of saliva, which appears to moderate the inflammation and irritation. The gums being swollen and attended by an itch-

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its reach. During sleep, it frequently and suddenly starts, and sometimes convulsions in particular parts of the body appear to take place. The urine, also, undergoes various changes; sometimes being voided quite pale, but most generally high coloured, and depositing at times a thick white, and at other times a red sediment. These are the symptoms which usually attend easy dentition; but, in children of irritable habits, symptoms of a more alarming and dangerous character, make their appearance, and are often such as the experienced only can trace to their true cause; such as fever, difficulty of breathing, spasmodic cough, scrofula, marasmus and convulsions. Besides these symptoms, a swelling of the tops of the feet and hands, is mentioned by Dr. Underwood, which, he observes, is not of much importance, as it

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generally disappears on the cutting of those teeth, which caused the affection. The same author mentions, that in a few instances a transient paralysis of the arms and legs, takes place, but Sir Astley Cooper in noticing the same circumstance, remarks that it sometimes continues with little alteration through life

Some of the symptoms mentioned as usually attending easy dentition; such as the flow of saliva, and spontaneous Diarrhea, are evidently intended by nature, to perform a very important part in her efforts to avoid constitutional symptoms; the first, by its profuse discharge, reducing the vessels of the part, the other the system in general. In order to further these natural means, the child should be limited in its food: if accustomed to animal food, or of any kind calculated to stimulate the sys=

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tion, it should be withheld, and be confined principally to the nourishment afforded by the mother; or, if it be weaned, to articles of light diet. In conjunction with this plan, it will be proper to pay particular attention to the situation as respects confinement. Because the indicative symptoms of a process so often looked after by the parent, with the utmost degree of anxiety, have made their appearance, it is not to be presumed that the poor infant should be confined to a nursery. On the contrary, every opportunity, consistent with propriety, of indulging the little patient in the open air, should be embraced. Exercise should be properly attended to, particularly when there is any marked excess of irritability; and this should be of such a kind as will be diverting to the mind of the infant, as well as afford sufficient exercise to the body:

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this is as necessary in this case, together with a modification of a proper temperature, and strict attention to the proper degree of clothing, as such a state of the atmosphere, attention to cleanliness, diet &c. as is conducive to support the system of those who are feeble — These are two states of the constitution which have been remarked before, as peculiarly liable to the susceptibility of constitutional affections during the process of teething. By adopting a proper course of treatment, in both cases, teething may be so conducted as to avoid the exciting of nervous affections, together with acute fever, on the one hand; and supporting debility, so as not to induce hectic and gradual decay on the other. The advantage resulting from a spontaneous discharge of the bowels, has already been noticed; proper attention therefore, to the state of the evacua=

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tions, should be carefully paid. The slightest degree of tardiness in their operation, should be obviated in order to guard against those severe constitutional affections, so apt to follow this state of the bowels. To effect this, immediate recourse must be had to the milder purgatives. Those which appear best adapted to this purpose, are Castor oil and Magnesia. The dose of either must be according to the age of the child. Magnesia may be given in the quantity of two or three Teaspoonsful to a child of six months to two years of age: to children of the same age, Castor oil may be administered in the dose of a Tea-spoon to a Table spoon ful. Should the desired effect not be produced by the use of these articles, and evident signs of severe symptoms show themselves, it will be necessary to resort to more efficient

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means, as calomel and Jalap, or the first mentioned articles may be repeated every hour or two, until the desired effect is produced. As constituting a part of the diet in this case, which requires strict attention, rye mush and molasses, are much spoken of in a note in Dr. James' edition of Burns. It is probable mush made of Wheat in the coarse state, would answer the same purpose. Observing then, the benefit arising from a loose state of the bowels, it would be advisable in the case of a spontaneous purging, to encourage, rather than to check it, particularly in children of a robust habit, for reasons already assigned, unless it be excessive, or attended with fever, and loss of appetite. It is remarkable, however, to what an extent it may proceed at this particular period, without doing any material injury, while, at any other time, the

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most serious consequences would result. But, if the discharge should be protracted with a degree of violence, so as to produce emaciation, attended with weakness and general debility, with the other symptoms denoting the severer form of Diarrhoea of Teething; such as pale and dejected countenance, the eyes dull and heavy, the features sunken, febrile paroxysms, nausea and vomiting &c; then must our attention be directed to its arrest, but not in too hasty a manner. As the object of this essay, is not intended to touch upon any of the complaints roused into action, by the process of dentition, but merely to point out some of the means by which the author conceives they may be obviated or lessened, the subject will be pursued no further. The custom of furnishing children with gumsticks, Coral and other hard substances, as means

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of furthering the protrusion of the teeth, has been condemned. The principle objection, it seems, to this practice is, that it hardens the gums, and thereby prevents absorption. As to the propriety of this objection, the want of experience forbids a word to be said upon the subject: recourse must be had to the authors who have noticed this point, for its reputation. Dr. Underwood considers them as agents in the behalf of nature, and in this respect, he certainly appears to have the argument in his favour; for what is more common than to observe children, during dentition to thrust their fingers, or any hard substance, into their mouth. Is not this practice instituted by nature, and does it not appear to afford them comfort, and relieve pain in a great measure, at least while the effects of the pressure remain? So far from

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retarding absorption by hardening the gums, it appears, that this institution of nature, acts as a stimulus to absorption, and draws more nourishment to the teeth, and consequently assists their protrusion. The injurious effects of these articles may arise from their tendency to bruise the gums, and induce a greater degree of inflammation, by which absorption may be prevented. These remarks, however, are not intended to favour the practice; for since the application of coral &c. may injure the gums, when used for this purpose; and since the process may be assisted by pressure, it would seem advisable to make use of such substances as have a broader surface, than the articles just noticed can possibly present to the gums. Amongst the black population of the South, it is quite customary to have a piece of silver coin suspended to the wrists of their children,

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during this ~~operation~~ process, and it is a remarkable fact, that they invariably suffer less from any constitutional affection, than the white children. This fact, and the use of the coin just noticed, certainly operate in favour of the employment of any hard substance, of whatever shape best calculated to its being easily carried to the mouth, provided it be furnished with flat surfaces, and of such thickness as not to injure the gums. But all our endeavours to lessen local irritation, arising from the protrusion of the teeth, and to avoid all sympathetic affections being provoked, may fail. When this is the case, and every symptom of derangement increases, the gums should be carefully examined, and if their colour or swollen state mark the cause, they should be immediately cut. To the performance of the operation of cutting the gums, it is presumed,

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that it would be advisable for the person employed to have an understanding of the order in which the teeth have been described, as making their appearance. From his acquaintance with this order, the true point of irritation will easily be discovered, and the lancet being applied to this particular spot, will save the child much unnecessary pain. The operation may be resorted to at any time, during the period of dentition. At the commencement of the shooting of the teeth, symptoms of an alarming character may present themselves; and altho' they may not be very near the surface, decided benefit results from the division of the stretched membrane, which is the source from whence the irritation proceeds. It may be proper, however,

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in this case, to mention that the protusion of the teeth will not take place so speedily, altho' the division of the membrane may be free, as when the edges of the teeth are visible at the time of the operation. The incision in this case may heal; and hence has arisen one of the objections to the operation, supposing that scars increase the difficulty of protusion. In opposition to this opinion, we have the experience of Mr. John Hunter, who states that "it frequently happens, particularly when the operation of cutting the gums is performed early in the commencement of the disease, that the gum will reunite over the teeth; in which case the same symptoms will be produced, and they must be relieved by the same method. I have performed the operation (says he) about ten

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times upon the same teeth, when the disease had recurred so often, and every time with removal of the symptoms" It may also be remarked, that the formation of scars produced by the operation cannot be an objection, when it is recollected, that newly formed parts are always more easy to yield, than when in the original state. In all cases where the operation is had recourse to, the lancet should be carried down to the teeth, so that they may be felt; for on the division of the investing membrane depends the relief, since, in consequence of its high degree of sensibility, when thus put upon the stretch, arises fever, convulsions &c. Caries of the lower set of teeth has been apprehended from the use of the lancet in performing the operation,

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extending to them in consequence of injuries sustained by the first set. But it must be recollected, that they are formed or rather protruded with the enamel completely protecting them from any injury which could occur from the lancet. And again, if the first set were not so defended, and thereby liable to receive injury from the lancet touching them, the second or set below them would not be exposed in like manner, as they are formed in sacks entirely separate. In the protrusion of the double teeth, the great degree of irritability, appears to be owing to one point of the tooth projecting above the others, and piercing the gum, leaving the other points under the remaining portion of the gum, which becomes so exquisitely sensible, that the child refuses

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to have it touched. The utility of the operation, in this case, must be obvious, and it should be performed in such a manner, as entirely to liberate the tooth. In either case, the pain, which is another objection to the application of the lancet to the gums, is not so extensive as has been supposed. The circumstance of children themselves, during dentition, asking to have their gums lanced, is a sufficient proof of this. The pain is of such short duration and the relief so instantaneous, every alarming symptom disappearing as soon as it is performed, that the child who a few moments before appeared to be in the very hands of death, now breaths consolation to the anxious and almost desponding parent. The high degree of inflammation of the gums, and the exquisite sensibility of the

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investing membrane, stretched over the points of the teeth, producing most intolerable pain; as is so clearly evinced by the constant cries of the child, and movements of uneasiness, that nature calls for the operation in the plainest language, and if not attended to, fever, convulsions and death soon put a period to existence.—

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